What's in a name?

The U.S. Department of Energy (DOE) has proposed building the **Versatile Test Reactor** to support research and development of innovative nuclear technologies. Not sure what **test reactors** are or how they differ from **power reactors** and **demonstration reactors**? Read on to learn about these different reactors.

	Power Reactors	Test/Research Reactors	Demonstration Reactors
Who operates them?	Utilities.	Private companies, national labs, government agencies and universities.	Developers and national labs.
What are they used for?	To generate thermal energy to produce electricity and hydrogen or drive industrial processes.	Scientific research and training. Test reactors maximize production of neutrons, which are used to test fuels, materials, and sensors. Universities also use them for training purposes.	To validate new reactor concepts for commercial use and assess performance. This data is important and helps ensure reactor systems operate as intended – a critical step on the path to commercialization.
How many are there in the United States?	Currently, there are 95 operating power reactors. Two new units are under construction at Georgia's Plant Vogtle.	More than 35. Most are located at universities though several national labs also house test reactors. DOE is proposing to build the Versatile Test Reactor, which would be its first new research reactor in decades.	None yet. DOE launched the National Reactor Innovation Center (NRIC) in 2019 to help reactor developers demonstrate technologies. NRIC provides resources for testing, demonstration, and performance assessment to accelerate deployment of new advanced nuclear technology concepts.
How are they operated?	Nuclear power plants run continuously for 18-24 months before refueling.	Test reactors are shut down and restarted frequently for change out of experiments and refueling which ensures the neutron flux, or number of neutrons available for testing, is high.	Depends on the design and validation protocol.
Interesting fact	Nuclear power supplies the United States with 20% of its total electricity production, and accounts for 55% of its carbon-free electricity.	Research conducted in test reactors results in better nuclear fuels, materials, and sensors. Because of these improvements, power reactors produce more electricity than they did 30 years ago.	The Nuclear Regulatory Commission requires all new nuclear technologies to undergo various licensing steps. Operating a "demonstration" plant – either a small-scale or full-size reactor at low power – helps support this process.

Did you know?
The Versatile Test Reactor is a one-of-a-kind scientific user facility capable of performing large-scale tests and experiments simply not possible today.

VTR
VERSATILE
TEST REACTOR

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